

“Basic Marine Electrical” Course Outline

This is a three day basic DC & AC marine electrical systems program. Text for the class will be “Boating Magazine’s Powerboater’s Guide to Electrical Systems” by Ed Sherman, the instructor.

DAY 1 – 8:30AM

- ✓ Direct Current Circuits
 - ❑ A Circuit
 - ❑ Ohm’s Law/How to use it
 - ❑ Load’s in Series/Parallel
 - ❑ Sources in Series/Parallel
 - ❑ Circuit Problems & Causes
- ✓ Direct Current Measurements
 - ❑ Digital Instruments
 - ❑ Troubleshooting with Testers
- ✓ Batteries
 - ❑ The Charge/Discharge Cycle
 - ❑ Battery Types & Design Features
 - ❑ Monitoring Batteries
 - ❑ Testing Batteries
- ✓ Batteries continued
 - ❑ Discharge/Charging Characteristics
 - ❑ Charging Recommendations
 - ❑ Sizing Storage Batteries
 - ❑ ABYC Standard E-10

DAY 2 – 8:00AM

- ✓ Alternators
 - ❑ Rotary-Current Machine
 - ❑ Diodes & Rectification
 - ❑ Controlling the Alternator
 - ❑ Type-P and Type-N Alternator
 - ❑ Powering the Regulator
 - ❑ Testing Charging Systems
 - ❑ ABYC Standards A-20
- ✓ Bonding
 - ❑ What is it?
 - ❑ Electrical System Grounding
 - ❑ Lightning Protection
 - ❑ Corrosion Protection
 - ❑ Stray-Current Corrosion
 - ❑ To Bond or Not to Bond
 - ❑ Testing Your Protection
 - ❑ Cathodic Protection
 - ❑ ABYC Standards E-2 and E-4

- ✓ DC Standards
 - ❑ Wiring Diagrams
 - ❑ Marine Wire
 - ❑ ABYC Load-Calculation Method
 - ❑ Allowable Amperage of Conductors
 - ❑ Conductor Sizes for Allowable Voltage Drops
 - ❑ Identification of Conductors
 - ❑ Installation of Wire runs
 - ❑ Over-current Protection
 - ❑ Making Connections
 - ❑ Ignition Protection
 - ❑ ABYC Standard E-9

DAY 3 – 8:00AM

- ✓ AC Basics
 - ❑ Alternate Current
 - ❑ AC Safety
 - ❑ Grounding
 - ❑ Conductor Identification
 - ❑ Ground-Fault Devices
 - ❑ Transformations
 - ❑ Measuring AC
 - ❑ Troubleshooting
 - ❑ Checking Polarity
- ✓ AC Standards
 - ❑ Shore Power
 - ❑ Generator & Inverter Sources
 - ❑ Main Panelboard
 - ❑ Load Calculations
 - ❑ Over-current Protection
 - ❑ Ground Fault Protection
 - ❑ Approved Wire & Cable
 - ❑ Conductor Installation
 - ❑ Ignition Protection
 - ❑ Galvanic Protection
 - ❑ Typical Shore-Power Circuits
 - ❑ ABYC Standard E-8 & A-28